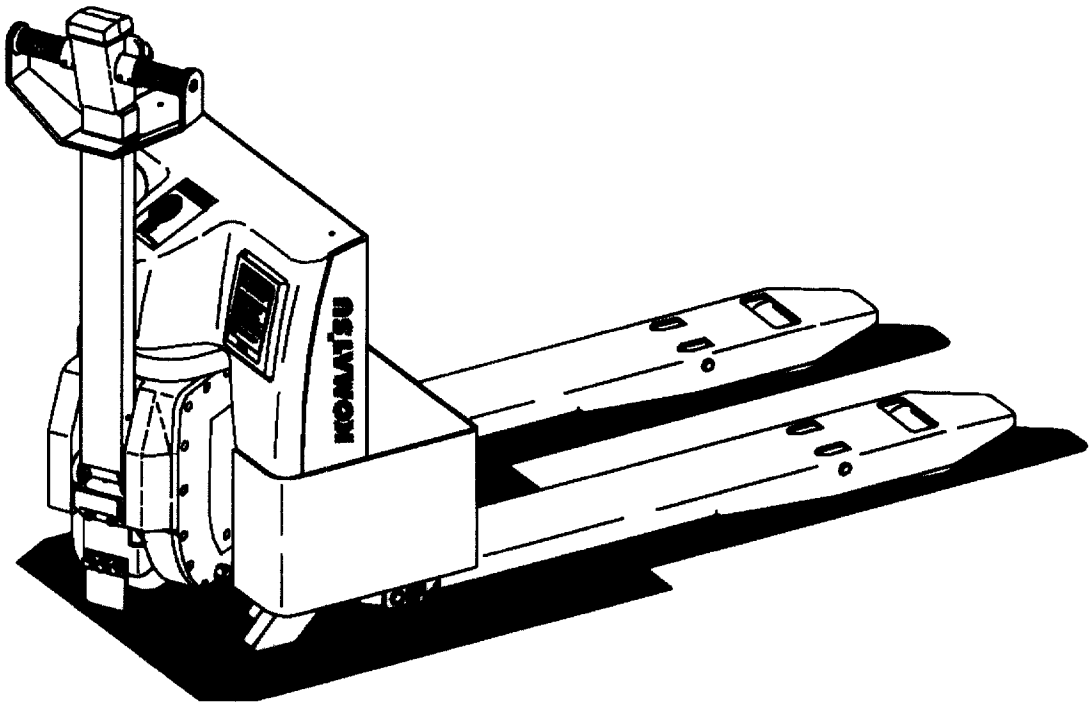
KOMATSU

Master Service Manual
SM088

MWL22-2A

Electric Low Lift Pallet Truck
Effective Serial Number MWL22-2A31141001 - UP



⚠**WARNING**	Read and observe all warnings on this unit before operating it.
⚠**WARNING**	**DO NOT** operate this equipment unless all factory installed guards and shields are properly secured in place.

Reference No: 311230-000

Date: March 28, 2002

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Standard Codes

B-Code = Business area
F-Code = Product family
T-Code = Product type
C-Code = Component function

Worksheet standard

W-Code = Working code
R-Code = Reason code
SO-Code = Assortment

F-Code List

PT Powered Pallet Trucks

T-Code List

No.	Model
390	MWL22-2A

C-Code List

No	Function Group	C-Code
0	Chassis	0000
1	Motors	1000
2	Drive Gear / Transmission	2000
3	Brake / Wheel System	3000
4	Steering System	4000
5	Electrical System	5000
6	Hydraulic / Pneumatic System	6000
7	Operating Function-lifting Cylinder	7000
8	Peripheral / Installation Equipment	8000

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9	Optionals / Attachments	9000
10	Tools	10000

Warning Symbols

Always follow the warnings given in this Service Manual and on the truck to avoid accidents and incidents from occurring.

1. Warning Levels

Warning levels

Warning text is given in four levels and provide information on the risks, describe the consequences, and instruct how to avoid accidents.

⚠ DANGER

Warns that an accident will occur if the instructions are not followed.
The consequences are serious personal injury or possibly death, and/or extremely large material damage.

⚠ WARNING

Warns that an accident can occur if the instructions are not followed.
The consequences are serious personal injury or possibly death, and/or large material damage.

⚠ CAUTION

Warns that an accident can occur if the instructions are not followed.
The consequences are personal injury and/or material damage.

NOTE!

Marks the risk of an accident or breakdown if the instructions are not followed.

Prohibitory Symbols

NO SMOKING

If smoking occurs in situations where a restriction against smoking is stated, a serious accident can occur.

OPEN FLAMES PROHIBITED

If open flames are used in situations where open flames are prohibited, a serious accident can occur.

GENERAL PROHIBITION

If the prohibition is ignored, a serious accident can occur.

1. Ordinance Symbols

SAFETY SHOES

When the directive for safety shoes is given, safety shoes shall always be worn to avoid personal injury.

PROTECTIVE GLASSES

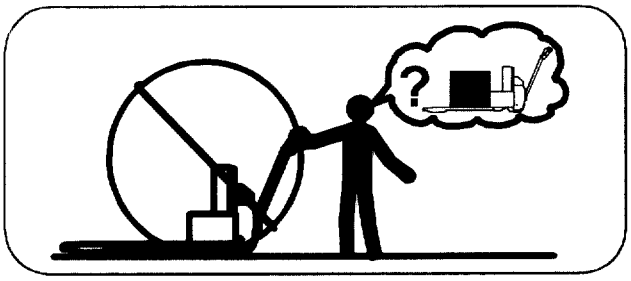
When the directive for protective glasses is given, protective glasses shall always be worn to avoid personal injury.

Safety

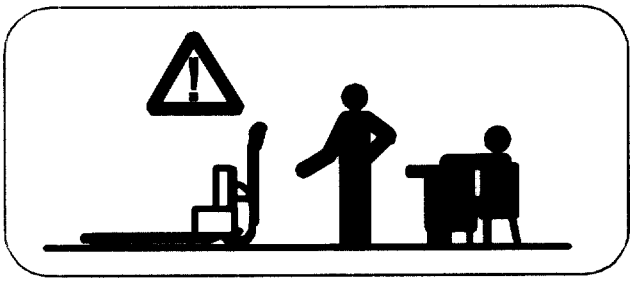
1. General Safety

Do NOT operate or work on this truck unless trained, qualified, and authorized to do so and have read the Operator's Manual.

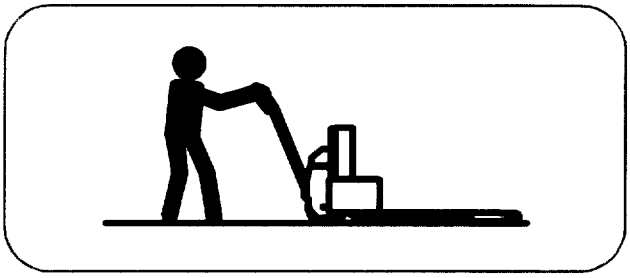
Know truck controls and what they do.



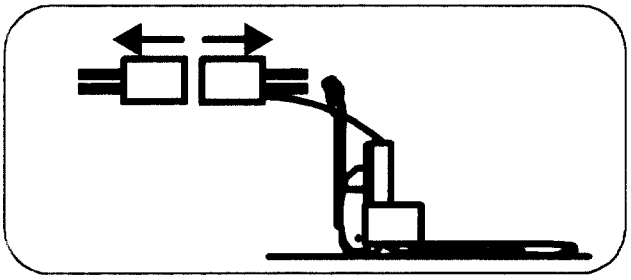
Do **NOT** operate truck if it needs repair or if it is in any way unsafe.



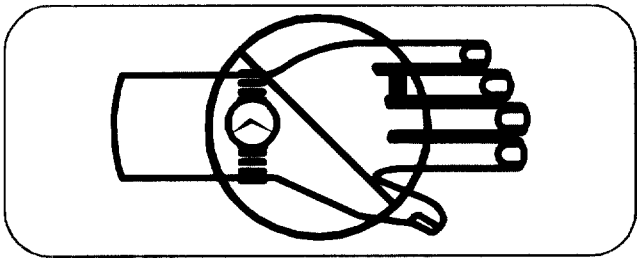
Operate truck only from the position of the Operator.



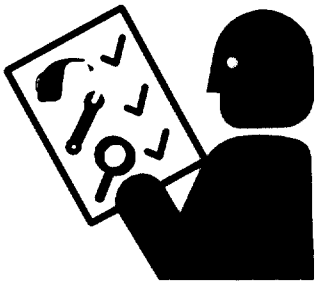
Before working on this truck always turn key switch to **OFF** and disconnect battery connector from truck (unless this manual states otherwise).



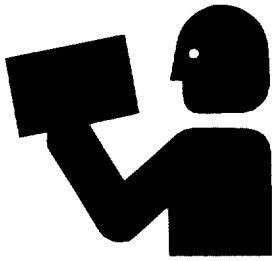
Do **NOT** wear watches, rings, or jewelry when working on truck.



Follow the scheduled lubrication, maintenance, and inspection steps.

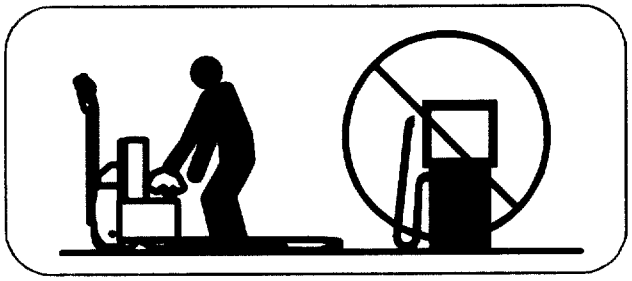


Follow exactly the safety and repair instructions in this manual. Do **NOT** take “shortcuts”.

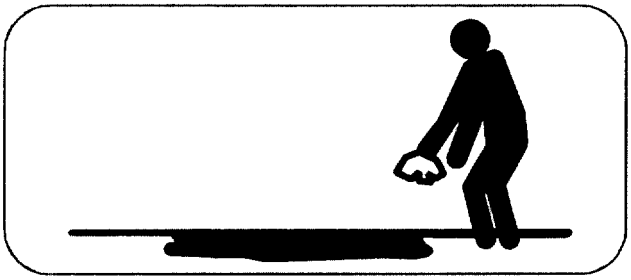


Do **NOT** Use an open flame near the truck.

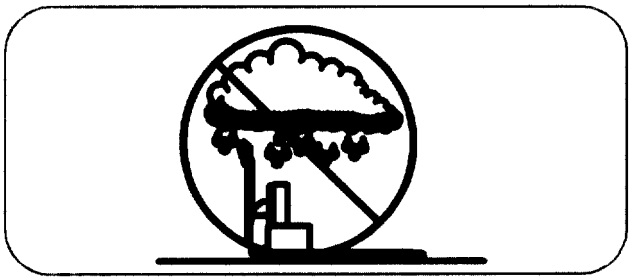
Do **NOT** use gasoline or other flammable liquids for cleaning Darts.



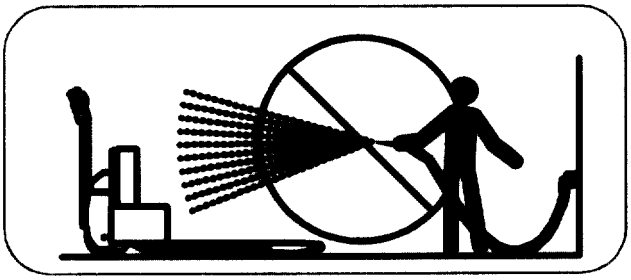
Clean up any hydraulic fluid, oil, or grease that has leaked or spilled on the floor.



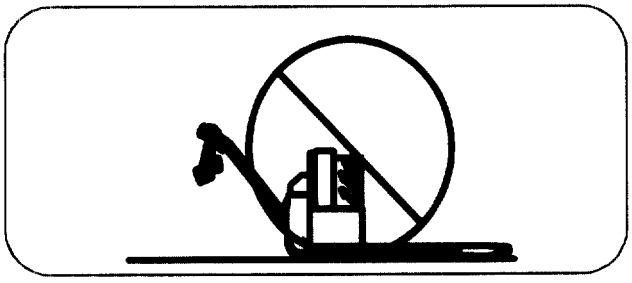
Always operate and park truck indoors.



Do **NOT** wash truck with a hose.



Do **NOT** add to or modify truck without written approval from **Komatsu Forklift U.S.A., Inc.**

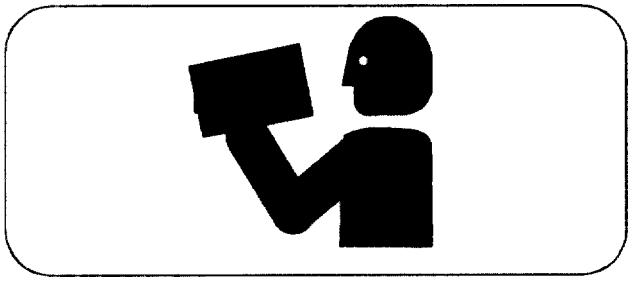


Battery Safety

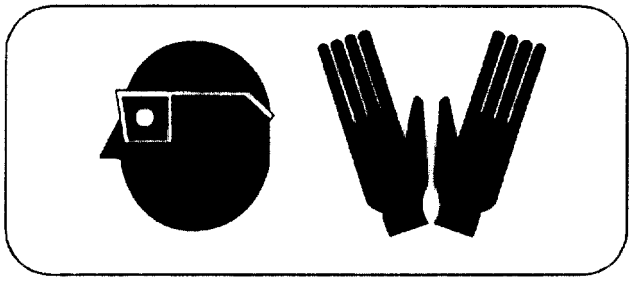
⚠WARNING As a battery is being charged, an explosive gas mixture forms within and around each cell. If the area is not properly ventilated, this explosive gas can remain in or around the battery for several hours after charging. Be sure there are no open flames or sparks in the charging area. An open flame or spark can ignite this gas, resulting in serious damage or injury.

⚠WARNING Battery electrolyte is a solution of sulfuric acid and water. Battery acid causes burns Should any electrolyte come in contact with clothing or skin, flush the area immediately with cold water. Should the solution get on the face or in the eyes, flush the area with cold water and receive medical attention immediately.

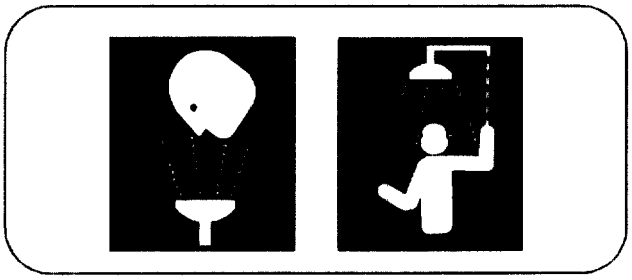
Read, understand and follow procedures, recommendations and specifications in the battery and battery charger manuals from the manufacturer.



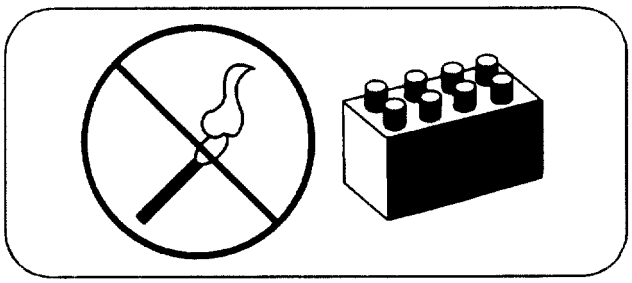
Wear personal protective equipment to protect eyes, face, and skin when checking, handling, or filling batteries. This equipment includes goggles or face shield, rubber gloves (with or without arm shields) and a rubber apron.



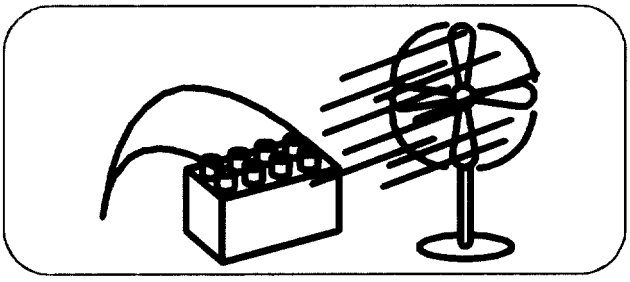
Make sure a shower and eyewash station are nearby in case there is an accident.



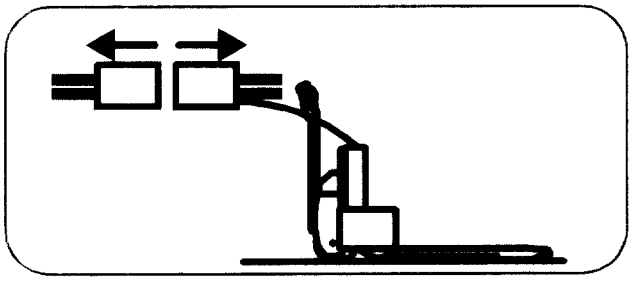
A battery gives off explosive gases. Never smoke, use an open flame, or use anything that gives off sparks near a battery.



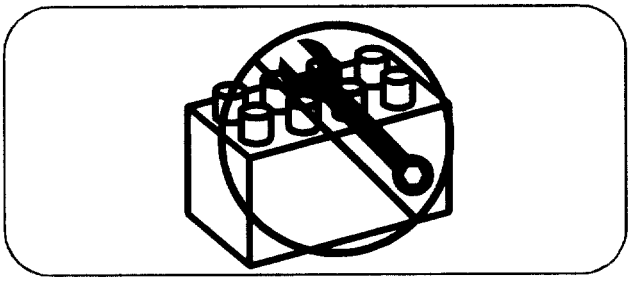
Keep the charger area well-ventilated to avoid hydrogen gas concentration.



Turn the key switch off before disconnecting the battery from the truck at the battery connector. Do **NOT** break live circuits at the battery terminals. A spark often occurs at the point where a live circuit is broken.

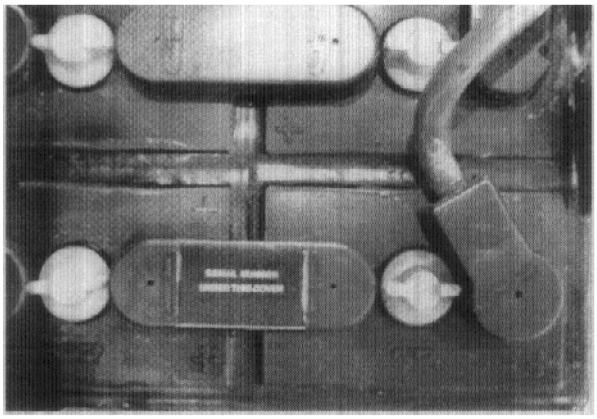


Do **NOT** lay tools or metal objects on top of battery. A short circuit or explosion could result.



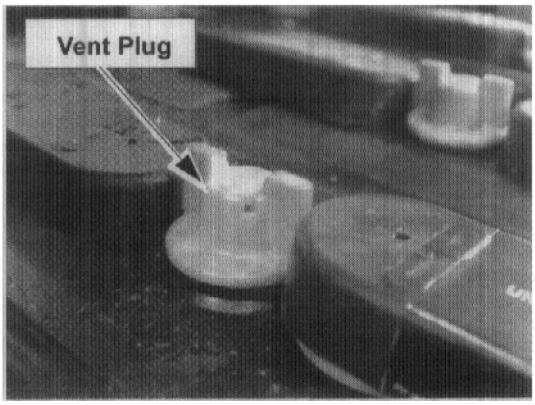
Keep batteries clean. Corrosion causes shorts and possibly sparks to the frame.

Keep plugs, terminals, cables, and receptacles in good condition to avoid shorts and sparks.



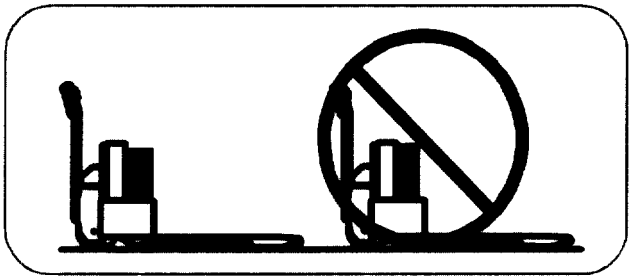
Keep filler plugs firmly in place at all times except when the electrolyte level is checked, when water is added to the cells or when the specific gravity is checked.

Make sure vent holes in filler plugs are open to allow gas to escape from the cells.

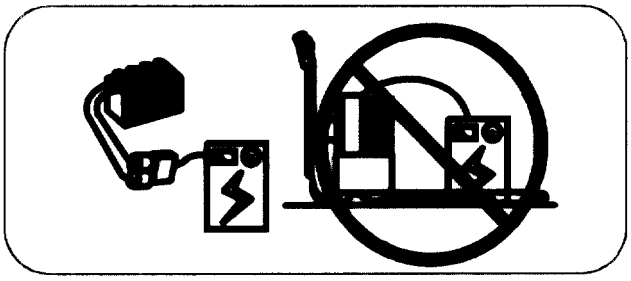


Do **NOT** allow cleaning solution, dirt, or any foreign matter to enter the cell.

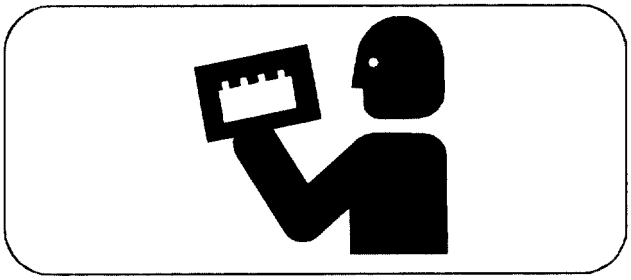
Make sure to install the correct size battery. A smaller or lighter weight battery could seriously affect truck stability. See the truck specification (data) plate for more information.



Never plug a battery charger into the truck battery connector. Plug battery charger **ONLY** into battery connector from battery.



Follow the charging procedures in the “Battery Instruction Manual” and in the “Battery Charger Instruction Manual”.



Static Safety

Electronic circuit board and devices used on the truck can be damaged by the discharge of static electricity, called electrostatic discharge.

Static charges can accumulate from normal operation of truck as well as movement or contact between non-conductive materials such as; plastic bags, synthetic clothing, synthetic soles on shoes, styrofoam coffee cups, etc.

Accumulated static can be discharged through human skin to a circuit board or component by touching the parts. Static discharge is also possible through the air when a charged object is placed close to another surface at a different electrical potential. **Static discharge can occur without seeing or feeling it.**

Whenever working on or near static-sensitive electronics, always use static discharge precautions.

1. Place a static discharge wrist strap around the wrist. Connect the ground lead to the wrist strap connector.

2. Connect the ground clamp to an unpainted, ground surface on the truck frame.

3. If removing or installing static-sensitive components, place them on a properly grounded static mat.

4. To transport static-sensitive components, including failed components being returned, place the components in an antistatic bag or box.

The wrist strap and associated accessories should be tested monthly to verify they are working properly. A defective static discharge wrist band will not alert that it is bad.

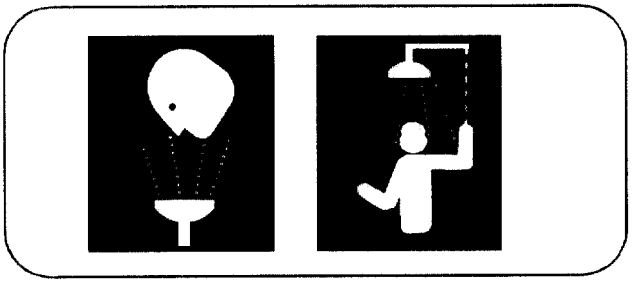
Welding Safety

⚠WARNING Flame cutting or welding on painted surfaces may produce potentially harmful fumes, smoke and vapors. Prior to performing flame cutting or welding operations, it is recommended that the coating be removed in the vicinity where the operation(s) will be performed.

⚠WARNING Coating removal may be by mechanical methods, chemical methods or a combination of methods. Flame cutting and/or welding operations should be carried out only in well ventilated areas using local exhaust if necessary.

Before working on truck, make sure of the following:

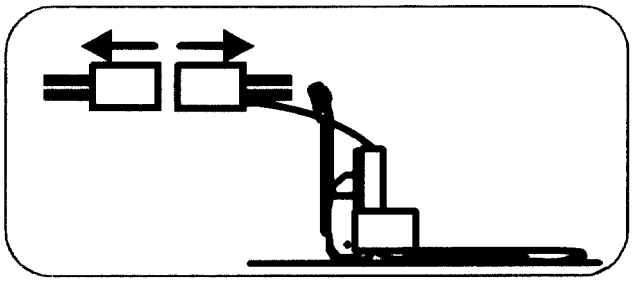
- Fire protection equipment is nearby.
- Know where the nearest eyewash station is located.



⚠ CAUTION Disconnect battery before attempting to inspect, service or repair truck.

- Check for shorts to frame. If any shorts are detected, remove before proceeding with the welding operation.
- Clean the area to be welded.
- Protect all truck components from heat, weld spatter and debris.

- Attach the ground cable as close to the weld area as possible.



- Disconnect all electrical cards before any type of electric resistance welding is done.
- Do not perform any welding operations near the electrical components.
- If welding must be done near the battery compartment, remove the battery from truck.
- When welding is completed, perform all ground tests and electrical inspections before the vehicle is operated.